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ABSTRACT

In order to identify antecedents of infants' compliance with mothers' directions on how to solve four tasks (graded in terms of stressfulness to the infant), 194 high-risk mothers and their 2-year-old children were observed on videotape and assessed with a six-point rating scale. Data collected prenatally and postnatally at 3, 6, 12 and 18 months of age were used in multiple regression analyses to identify antecedents of compliance. Maternal personality variables, infant characteristics assessed shortly after birth and mother/infant interaction variables assessed at 6 months were related minimally to compliance. The quality of mother-infant attachment (assessed with the Ainsworth-Wittig (1969) Strange Situation procedure) at 12 and 18 months did predict compliance at 24 months. Securely attached infants were significantly more compliant than anxiously attached infants. (Author/RH)

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ANTECEDENTS OF COMPLIANCE IN 2-YEAR-OLDS FROM A HIGH-RISK SAMPLE

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Much of the literature on the socialization of young children has been based on the traditional belief that child and society are in conflict and something must be done to cause the child to behave appropriately. Ethological/evolutionary theory (Bowlby, 1969; Stayton, Hogan and Ainsworth, 1971) proposes instead that socialization is the predictable outcome in an "ordinary, expectable" environment. This theory suggests that a disposition to obey the caregiver's signals is biologically adaptive and that this disposition grows out of the affectional tie between the caregiver and child, rather than being the result of specific training. (This is not to deny the importance of learning in the acquisition of specific behaviors; but rather to highlight the importance of an underlying willingness to learn the behaviors deemed appropriate in one's environment.)

Researchers have begun to provide empirical evidence which supports this theory. Stayton, Hogan and Ainsworth (1971) and deVries and deVries (1977) found a strong relationship between infant compliance and maternal sensitivity and responsiveness. In studies of the relationship between quality of mother-infant attachment and later competence, Matas, Arend, and Sroufe (1978) and Main (1975) found that securely attached children were more compliant than anxiously attached children.

Joffe (1981) observed 112 mother-infant pairs using the Ainsworth Strange Situation and a laboratory-based prohibition situation, developed to assess infant compliance and maternal style of discipline. At 12 and 18 months of age, securely attached babies were more compliant than anxiously attached babies, and the mothers of the securely attached infants were less intrusive and more helpful than mothers of anxiously attached babies.

The present study is based on the same sample from which Joffe drew his subjects. While Joffe found a relationship between attachment and compliance measured at the same time, this study attempts to extend the relationship to compliance as observed in a problem-solving situation at 24 months. We also attempt to identify some antecedents of two-year-olds' compliance by examining infant characteristics, maternal characteristics, child and mother behaviors in interactional situations, and life circumstances.

Method

Subjects

These data are part of the Mother-Child Interaction Project at the University of Minnesota, a longitudinal, prospective study of 267 high-risk mothers and their firstborn infants. The project is under the direction of Byron Egeland, Amos Deinard, and Alan Sroufe. Subjects were recruited from the Minneapolis Public Health Infant and Child Care Clinic, which provides care only for families in lower income brackets. At the time of the baby's birth, mothers ranged in age from 12 to 37 years with a mean age of 20.52 years (SD = 3.65). Sixty-two percent were unmarried and 86% reported that their pregnancies were unplanned. Forty-one percent of the mothers had not completed high school at the time their babies were born; five percent had not graduated from high school but were continuing their education in some type of vocational school. Fifty-five percent of the children are males. Although 267 mothers originally were enrolled in the study during their last trimester of pregnancy, 194 mothers and their two-year-olds participated in the problem-solving tasks during which compliance was assessed.

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Procedure

Assessment of Infant Characteristics: In order to assess characteristics of the infant, three techniques were used. First, naturalistic observations were made by nurses in the newborn nursery who then rated each infant on such factors as activity level, alertness, irritability and soothability. Second, the Neonatal Behavioral Assessment Scale (Brazelton, 1973) was administered to each infant at home seven and ten days after birth. This scale consists of 21 reflex and 26 behavioral items, which assess habituation to repeated stimuli, orientation to inanimate and animate stimuli, motor maturity, state control and physiological regulation. Third, when the infants were six months old, each mother completed the Carey Infant Temperament Questionnaire (1970). This measures the mother's perception of her baby's activity, rhythmicity, adaptability, approachability, intensity, mood, distractibility, persistence, and the general difficulty or ease of caring for her infant. We also administered the Bayley Scales of Infant Development (1969) when the children were two years of age.

Assessment of Maternal Characteristics: Three months postpartum, each mother completed a battery of tests assessing certain personality characteristics, and her needs, expectations and perceptions regarding childbirth and parenting. The Personality Research Form (Jackson, 1967) was used to measure aggression, defendence, impulsivity, succorance, and social desireability. Maternal anxiety (IPAT, Cattell and Scheier, 1963) and locus of control (Rotter, 1966) were also assessed. The Pregnancy Research Questionnaire (Schaefer and Manheimer, 1960) and the Maternal Attitude Scale (Cohler, Weiss, and Grunebaum, 1970) measured such characteristics as emotional reactions to pregnancy, attitudes toward childrearing, interpersonal maturity, and understanding of the psychological complexity of parenthood. These measures were selected on the basis of demonstrated reliability and validity as well as the ease with which they could be administered to adults with below-average reading skills.

Assessment of Mother-Child Interaction: When the infant was six months of age, observers visited the home to observe mother and child in two feeding situations and one play situation. In the feeding situation, 33 variables were rated using 7 or 9-point scales. Observed behaviors included maternal expressiveness, positive regard, negative regard, facility in caretaking, quality of physical contact, sensitivity, cooperation, quality of verbalization, and baby's social behavior. The six-month play situation consisted of fifteen minutes of observation after which the mother and infant were rated on 12 variables using a 9-point scale. Variables included baby's activity, coordination and satisfaction, mother's supportiveness, patience and amount of reciprocal play. Raters met weekly to ensure adequate reliability in their observations.

At 12 and 18 months, the quality of infant-mother attachment was assessed by means of the Strange Situation (Ainsworth and Wittig, 1969). This is a 20-minute procedure taking place in a room filled with toys. It consists of eight episodes in which the infant is observed in this unfamiliar environment, with an unfamiliar adult female, both with the mother present and absent. Infants are classified into three major groups (A,B,C), primarily on the basis of their behavior during the reunion episodes. Securely attached infants (Group B) greet their mother positively, actively seek proximity or interaction with the mother, and display few, if any, negative behaviors toward her. These infants typically explore and play during the pre-separation episodes of the test, evidence that the mother's presence provides security in the unfamiliar environment (Ainsworth and Bell, 1974). Infants who exhibit substantial negative behavior toward the mother during the reunion episodes are classified as anxiously attached (groups A and C). Infants are classified in group A when they avoid the mother by turning away, looking away, ignoring her. Group C infants, on the other hand, show angry resistance to their mothers during reunion. They often exhibit a high level of distress upon separation or even in the unfamiliar setting when the mother is present. They often appear ambivalent upon reunion, actively seeking proximity with the mother, yet angrily pushing her away.

At 24 months, the children and their mothers were videotaped in a series of tool-using/problem-solving tasks of increasing difficulty. In each task a small toy or candy was visible inside a clear plexiglass container, but was accessible to the child only if s/he used a tool in a specific way to remove the prize. The first two tasks required the child to push the prize out with a stick. In the third task, the child had to connect two smaller sticks to make a stick long enough to push out the toy. The final task was more complicated, requiring thatthe child place a heavy block on one end of a see-saw, causing the other end of the see-saw, with a treat attached, to rise within the child's reach inside of the plexiglass container. The mother was instructed to help her child when she felt she needed to. These tasks were designed to stress the child's capacities to use his/her own resources and the resources of the mother. Assessment of the mother

focused on the emotional support and the clarity and quality of help she offered her child in this relatively taxing situation. Ratings were made of the child's enthusiasm, persistence, dependency, anger, and compliance. The present study focuses only on compliance as measured by a six-point rating scale. Interrater reliability was .79, based on 36 cases which were rated by two or three independent raters. A rating of one was defined as a child who actively oriented toward mother's directions, complied to all major task directions, molding his/her behavior into a collaborative effort with the mother. While the child did not necessarily do everything the mother suggested, this was seen as autonomy within a compliant orientation, rather than intentional negativism. At the opposite pole of the scale, the noncompliant child refused to comply with virtually all directions given by the mother. This sometimes was expressed as overt negativism, but also included quiet ignoring of maternal directions.

Assessment of Life Circumstances: Based on interview data, the status of mother's relationship with a husband or boyfriend was noted when her child was six months, 12 months, 18 months, and 24 months of age. Relationship categories included: 1) living together or married; 2) involved, but not living together; 3) not involved with anyone.

When her infant was 18 months old, each mother was given the Life Events Scale (Egeland, Breitenbucher, and Rosenberg, 1980), which rated the occurrence of 44 events during the previous 12 months. Items dealt with such things as financial problems, difficulty with welfare, a boyfriend's moving out, and an increase in arguments with a friend.

Results and Conclusions

The mean compliance rating for the total sample was 3.19 with a standard deviation of 1.45. (A rating of 1 indicates the most compliant and 6 the least compliant.) For boys, the mean was 3.23 (SD = 1.5) and the mean for girls was 3.14 (SD = 1.39).

Infant Characteristics: Multiple regressions were performed to determine if there was a relationship between compliance at two years and the following infant characteristics: baby alertness, as assessed by nurses in the newborn nursery; orientation and irritability, both factor scores derived from the Brazelton Neonatal Behavioral Assessment Scale (1973); the mother's evaluation of the ease or difficulty of caring for her infant, based on the Carey Infant Temperament Questionnaire (1970) administered six months postpartum; and the baby's social behavior as observed in the six-month feeding situation. These variables were not significantly related to compliance (multiple R=.20, n.s.). When developmental quotient, assessed at 24 months by the Bayley Scales of Infant Development (1969), was included in the regression, the multiple R=.29,ns),with the other variables adding little to the variance accounted for by developmental quotient. (The simple correlation between compliance and developmental quotient was .25). When regressions were run separately by sex, there still was no significant relationship between compliance and early infant characteristics.

Because of a practical, clinical interest in children who received extreme scores on this measure, groups of children at the ends of the compliance dimension were tested for mean differences on the infant variables. Nine children receiving a rating of six on the compliance scale comprised the extremely noncompliant group. Seven of these nine children were boys. The compliant group was made up of 26 children, 14 males and 12 females, who received a rating of one on the scale. Significant results were obtained for only two variables. Compliant children were more alert as newborns (t=2.71, p=.013) and had higher developmental quotients at age two (t=4.51, p=.000) (see Table 1). There were no differences between the two groups on Brazelton factor scores, baby social behavior in the six-month feeding, and the Carey temperament scores. These tests of mean differences were not run separately by sex because of the small number of cases.

These analyses suggest that compliance is not predicted by early infant variables, with the possible exception of infant alertness which was related to compliance in the extreme group. Compliant two-year-olds were more developmentally advanced, as measured by the Bayley, than were noncompliant children.

Maternal Characteristics: To test the power of maternal characteristics and maternal behavior in interactional situations in predicting compliance, the following variables were subjected to multiple regression: mother's age and education; mother's interest in her newborn baby, as assessed by nurses in the hospital; four factor scores derived from personality assessment done three months postpartum, impulsivity/anxiety, negative reactions to pregnancy, psychological complexity, and hostility/suspiciousness; the mother's cooperation and sensitivity with her infant in the six-month feeding and play situations. No significant relationship was demonstrated between these maternal variables and the child's compliance (multiple R=.25), nor were there significant results when analyses were run separately by sex.

Groups of children obtaining extreme scores on the compliance measure were tested for mean differences on the same maternal variables that were used in the multiple regressions, plus maternal caretaking skills and affective behavior in the six-month feeding situation and supportive presence, measured simultaneously with compliance in the problem-solving task. Group differences were found only for the psychological complexity factor score ($t=3.23$, $p=.004$), sensitivity ($t=2.34$, $p=.041$), and supportive presence ($t=5.92$, $p=.000$), with mothers of compliant children receiving higher scores on each of these variables than did mothers of non-compliant children. The psychological complexity factor is based on three scales from Cohler's Maternal Attitude Scale: I. appropriate vs. inappropriate control of the child's aggression; II. encouragement vs. discouragement of reciprocity; III. acceptance vs. denial of emotional complexity in child care. These scales tap the maturity of the mother in this new and difficult interpersonal situation--parenthood. A high score on this factor implies a certain integrity of ego functioning that subsumes many aspects of personality, including intellectual ability, general comprehension, and, most significantly, the ability to deal effectively with the ambivalent and stressful affect which typically accompanies a first pregnancy. Mothers scoring high on this factor, as did these mothers of compliant children, recognize their own and their child's need for autonomy. They accept their own psychological complexity and, thus, accept the complexity of their child. Mothers of compliant children also were observed to be sensitive to the cues and signals of their young infants and to provide warm support to their children in the problem-solving task. These data are consistent with the findings of other researchers (Stayton, Hogan, and Ainsworth, 1971; deVries & deVries, 1977; Joffe, 1981).

Combined Mother and Child Variables: To determine if mother and child variables together might predict compliance, variables used in the separate regressions described above were combined and subjected to another regression analysis. The mother's score on the Life Events Scale (Egeland, Breitenbucher and Rosenberg, 1980) was also entered into the regression equation. Even these combined variables did not relate significantly to compliance, for the total sample nor separately by sex. However, due to missing data for some variables, these regression analyses were based on a relatively small number of cases for the large numbers of variables involved.

Life Circumstances: Not only did Life Events scores not account for a significant proportion of compliance variance in the total sample, but these Life Events scores also did not differentiate between the extremely compliant and extremely non-compliant groups. Another indicator of life circumstances was the status of the mother's relationship with a husband or boyfriend, which we felt might have an impact on the child's willingness to comply with the mother. Analysis of variance was performed to determine if there were differences in the compliance ratings among children whose mothers were living with a husband or boyfriend, children whose mothers were involved but not living with a husband or boyfriend, and children whose mothers were not involved with anyone. There were no significant differences among these groups on the compliance measures. Although status of the mother's relationship previously was found to be related to attachment (Pastor, et al., 1981), and life events have been found to relate to other child behaviors, life circumstances did not predict compliance in this sample.

Attachment: Significant differences on the compliance rating were found among the three stable attachment groups ($F=6.16$, $p=.003$). For subjects whose attachment classification remained stable from 12 to 18 months of age, the securely attached infants were morecompliant (Mean = 2.91) than the anxiously attached groups (Anxious/avoidant $\bar{X} = 3.94$; Anxious/resistant, $\bar{X} = 4.09$). The two anxiously attached groups did not differ significantly from each other on the compliance measure. When analyzed separately by sex, results were significant only for girls on the 18-month attachment classification ($F=3.58$, $p=.034$) and for girls whose classification was stable from 12 to 18 months ($F=6.81$, $p=.003$). Anxious/resistant girls were less compliant than securely attached girls. Results approached significance for boys with stable attachment classifications ($F=2.46$, $p=.097$) (see Table 2).

In summary, early infant variables were only minimally related to compliance assessed at two years. The only early variable on which compliant and non-compliant children differed significantly was alertness, where it was found that compliant two-year-olds were more alert as newborns than were non-compliant children. A relationship was also found between compliance at two years and the child's developmental quotient, also measured at two years. It seems plausible that children who are more developmentally advanced would be more compliant, and perhaps just as plausible that compliant children would perform better on a test such as the Bayley which requires that they follow the examiner's directions.

The results of the multiple regression indicated that the maternal variables were also minimally related to compliance. However, there were some significant findings for the analyses involving extreme groups. The mothers of compliant children were found to have a better understanding of the psychological complexity of their children and themselves, and were better able to

deal with the ambivalence and stress which often accompanies a first pregnancy. Also, these mothers were observed to be more sensitive to their six-month-old baby's signals in feeding and play situations than were the mothers of non-compliant children. Mother's supportive presence, measured simultaneously with compliance in the two-year problem-solving task, understandably differentiated between compliant and non-compliant children. The strong relationship between these variables suggests a picture of a competent mother-child pair, working in cooperative collaboration with each other to complete the tasks in this problem-solving situation.

Life circumstances, which included scores on the Life Events Scale and also the status of the mother's relationship with a husband or boyfriend, did not predict compliance in this sample. Although these infant, mother, and life circumstance variables did not show a strong relationship to compliance, the validity of these measures has been demonstrated previously in predicting attachment classification (Farber and Egeland, 1980) and also predicting other child behaviors in the problem-solving situation.

Despite the fact that most variables assessed early in the infant's life were not related to compliance, the quality of mother-infant attachment assessed at 12 and 18 months did predict compliance at two years. Securely attached infants were significantly more compliant than anxiously attached infants. When these analyses were run separately by sex, the results were highly significant for girls, with anxious/resistant girls less compliant than securely attached girls. The results approached significance for boys. These results provide support for the ethological/evolutionary hypothesis that a disposition to comply grows out of the mother-child affectional relationship.

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Table 1

Mean Differences Between Groups of Extremely Compliant and Noncompliant Children

Variable	Group 1 Compliant Mean	SD	N	Group 2 Noncompliant Mean	SD	N	t	p
Infant								
Baby Alertness Factor Score	.58	.80	17	-.40	.86	8	2.71	.018
Developmental Quotient	110.58	20.47	26	82.78	14.05	9	4.51	.000
Maternal								
Psychological Complexity Factor Score	.24	.83	26	-.48	.43	8	3.23	.004
Sensitivity	6.16	1.54	19	4.43	1.72	7	2.34	.047
Supportive Presence	10.45	2.01	20	5.63	1.92	8	5.92	.000

TABLE 2

One-Way Analysis of Variance for Noncompliance by Attachment Classification*

Variable	Group A Anxious/Avoidant Mean	SD	N	Group B Secure Mean	SD	N	Group C Anxious/Resistant Mean	SD	N	F	p	Student Newman-Keuls
Noncompliance for total sample	3.94	1.51	18	2.91	1.30	58	4.09	1.45	11	6.16	.003	A,C > B
Noncompliance for boys	4.10	1.52	10	2.97	1.47	31	3.63	1.41	8	2.46	.097	---
Noncompliance for girls	3.75	1.58	8	2.85	1.10	27	5.33	.58	3	6.81	.003	C > B

*Significant results only for infants whose attachment classification was stable from 12 to 18 months of age.